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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,699	06/15/2001	Xiaoming Ren	107044-0009	1351

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EXAMINER

YUAN, DAH WEI D

ART UNIT PAPER NUMBER

1745

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/882,699

Applicant(s)

REN, XIAOMING

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 124-127 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 124-127 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12022005</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1745

**METALIC LAYER COMPONENT FOR USE IN A DIRECT OXIDATION FUEL CELL**

Examiner: Yuan

S.N. 09/882,699

Art Unit: 1745

July 11, 2006

**Detailed Action**

1. The Applicant's amendment filed on May 16, 2006 was received. Claims 117-123 were cancelled. Claim 124 was amended. Claims 126,127 were added.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on December 19, 2005.

***Claim Rejections - 35 USC § 103***

3. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Marchetti (US 5,869,202) in view of Neumann et al. (US 6,652,804) on claim 124 are withdrawn, because the claim has been amended.

4. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Marchetti (US 5,869,202), Neumann et al. (US 6,652,804) and Yu et al. (US 6,399,202) on claim 125 are withdrawn, because the independent claim has been amended.

5. Claims 124,126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisar et al. (US 6,562,507) in view of Neumann et al. (US 6,652,804) and further as evidenced by Cisar et al. (US 6,410,180).

Cisar et al. ('507) teach a proton exchange membrane (PEM) fuel cell, wherein a gas diffusion layer (104) is disposed adjacent to a membrane (106). The gas diffusion layer is selected from sintered metal particles or sintered metal fibers. See Column 5, Lines 1-12; Column 9, Lines 1-25; Figure 13. Cisar et al. do not specifically teach the use of liquid fuel as the reactant. Nevertheless, it is well known in the fuel cell art the PEM fuel cell can use gaseous fuels, such as hydrogen, or liquid fuels, such as methanol. See Cisar et al. ('180), Column 6, Lines 1-6; Column 7, Lines 40-58. Furthermore, Cisar et al. ('507) do not teach or suggest the porosity size of the sintered metal is determined by the size of the metal particles. Neumann et al. teach a method for producing an openly porous sintered metal component. It is disclosed that the porosity is determined essentially through the specification of the particle size and the flow resistance is determined through the thickness and the particle size of the sintered metal component. See Column 4, Lines 14-29. Therefore, it would have been obvious to one of ordinary skill in the art to modify the particle size and thickness of the sintered metal of Cisar et al., because Neumann et al. teach the diameter (size) of the metal particles controls the porosity size and flow resistance of the sintered metal component. The term "direct oxidation fuel cell" is understood as a fuel cell system wherein liquid fuel is introduced into the fuel cell without processing.

6. Claims 125,127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisar et al. (US 6,562,507) and Neumann et al. (US 6,652,804) as applied to claims 124,126 above, and further in view of Yu et al. (US 6,399,202).

Cisar and Neumann teach a direct oxidation fuel cell system as described above in Paragraph 5. However, Cisar and Neumann do not disclose the metallic diffusion layer is treated with a substance that renders a portion of the layer hydrophilic. Yu et al. disclose a gas-diffusion electrode for use in a fuel cell system. Specifically, Yu et al. teach the fabrication of gas diffusion electrode with a precisely controlled degree of hydrophobic and/or hydrophilic characteristics by using functional groups. Water-repellent structures of the diffusion layer are generally achieved by coating the surface with a hydrophobic material, such as polytetrafluoroethylene. The most common method to make the diffusion layer partly hydrophilic includes the use of a hydrophilic fluorinated resin, such as NAFION. As a result, the gas diffusion layer, which has attached at least one hydrophilic organic group as well as at least one hydrophobic organic group, can better promote a hydrophobic/hydrophilic balance in the active layer. See Column 1, Lines 66-67; Column 2, Lines 35-41; Column 3, Lines 17-45; Column 6, Lines 32-37. Therefore, it would have been obvious to one of ordinary skill in the art to treat the metallic diffusion layers of Cisar and Neumann et al. with both PTFE and NAFION® to encourage water to flow in predetermined directions and oxygen to flow in predetermined directions, respectively, because Yu et al. teach the importance of optimum hydrophilic/hydrophobic properties on the metallic diffusion layers.

*Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan  
July 11, 2006



**DAH-WEIYUAN**  
**PRIMARY EXAMINER**